

September 10, 1960

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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



Uakari Sets Record

See Page 166

A SCIENCE SERVICE PUBLICATION

Kodak reports on:

the parts-per-billion business... paste, beautiful paste... a water-based lacquer

Spectroscopy in electronics

We wish we could inspire several dozen more persons to enter the craft of emission spectrography. They would become customers for *Kodak Spectrum Analysis Plates and Films* as well as occupants of a secure place in technical society, one of waxing importance.

To convince that the importance indeed waxes we could send copies of a disquisition written by one of our dealers, a gent willing to undertake some deep thinking and digging out of useful information in hope of the favor of an order.

Think of the old days, he suggests, when electronics meant radio and the man at the end of the radio assembly line was given plenty of adjustable resistors, capacitors, and coils on the chassis to adjust in compensation for the unpredictable characteristics of the vacuum tubes. Electronics isn't that way any more, he implies. Today electronics is supposed to assume that its solid-state devices and the cathodes of its vacuum tubes will behave predictably within very narrow limits.

And what sets these limits?

Among other things, the presence or absence of certain chemical elements in the range of parts per billion.

How determined?

By emission spectrography.

Is this easy?

Not particularly.

What's one way to start surveying the techniques?

Writing for a copy of "Spectroscopy in Electronics" to Eastman Kodak Company, Special Sensitized Products Division, Rochester 4, N. Y.

Amylose and culture

Spaghetti and macaroni are basic.

The idea of making wheat flour up into a paste and drying it for future use must have come very early. Enter esthetics. The human spirit must be nourished along with the human body. For reasons apparently unrelated to biological metabolism, the paste must be dried in certain shapes, and the integrity of these shapes must be preserved right to the pearly portal of the alimentary tract. This principle is ancient: the ancient Romans ate spa-

ghetti with cheese; the ancient Japanese ate macaroni pressed from a paste of cooked rice.



When spaghetti or macaroni is cooked for too long or allowed to stand cooked, the human spirit is offended. The morsels of *pasta* revert to a sticky paste, millennia of cultural advance undone because amylose has gone into solution and then has loosely hydrogen-bonded itself into a net of slime. But for this unfortunate tendency, the world's food supply would be less dependent on specialized durum wheats. Without them, the spaghetti and macaroni would get even stickier even faster.

The problem now appears to be as soluble as the amylose itself.

First fruits of the victory can already be tasted. Try any of the up-to-date dehydrated potato-flake brands. See how the dish instantly prepared from it compares with freshly and expertly cooked home-whipped potato.

Whatever the future holds for spaghetti and macaroni, the reason the instant-potato thing works out so well is that the processors add a very small percentage of pure monoglyceride. It complexes the dissolved amylose so securely that even the familiar iodine-blue test can scarcely find it.

These Myverol Distilled Monoglycerides we prepare by glycerolysis of familiar vegetable and animal food fats. They are officially recognized as safe. Investigators who would like samples of them with which to try remedying stickiness in any starchy foods are invited to write Distillation Products Industries, Rochester 3, N. Y. (Division of Eastman Kodak Company).

Creamed butyrate

In this nation of do-it-yourselfers and of housewives capable of taking the bit in their own teeth when occasion

demands, do you think there would be a market for a cream that can be spread over bare wood with cheesecloth to deposit in seconds a surface chemically and physically identical to a coat of highest quality lacquer?

We have made such a cream—a stable, freeze-and-thaw-resistant water emulsion of the same kind of cellulose acetate butyrate on which the best grades of conventional lacquers are based.

The cream eliminates separate fillers, sealers and wash coats, long drying periods, excessive sanding operations, and spraying equipment. With one, two, or three coats a range of effects can be produced from a flat "natural" surface to a rich, semi-glossy, "rubbed" surface. The fast film formation permits application of successive coats within minutes and eliminates the problem of surface imperfections from dust in the air. The successive coats do not soften or attack those previously applied. Instead of sanding and polishing of the dried film, gentle rubbing as the film forms fills the irregularities in the wood and smooths out the top of the lacquer. Though water-based, the cream does not raise grain as one might expect. After drying, the film has good resistance to water. It adheres well to the wood, seals it well, prevents penetration of subsequently applied conventional finishes (if they are desired) but holds them tenaciously.

The product itself is almost water-white, with the color stability to sunlight for which all cellulose acetate butyrate coatings have been esteemed. It neither darkens wood nor is itself darkened with the passage of time.

All these interesting properties we have demonstrated to our own satisfaction. The intricacies of marketing such a product through paint stores, supermarkets, five-and-dimes, or similarly formidable retail channels fill us with dismay. Therefore we thought we would here ask around what companies are interested in trying to make hay with this lovely development. (We ourselves incline to confine our consumer marketing to the photographic kind of film and cameras, projectors, and associated merchandise.) If indeed there are any such companies, Eastman Chemical Products Inc., Kingsport, Tenn. (Subsidiary of Eastman Kodak Company) will tell them all about emulsified butyrate.

This is another advertisement where Eastman Kodak Company probes at random for mutual interests and occasionally a little revenue from those whose work has something to do with science

Kodak
TRADE MARK

BIOLOGY

Link to Man's Heredity

Forerunners for man's heredity, chemical changes in water, and chemicals producing smell, are reported by Gloria Ball from the American Institute of Biological Sciences meeting.

► A POSSIBLE missing link in the evolution of heredity mechanisms has been found and photographed in simple yeast cells by a University of Chicago scientist, Dr. Balaji Mundkur.

In these cells Dr. Mundkur found cords that may be the forerunners of the chromosomes through which man and other animals pass on characteristics from generation to generation.

Speaking before the Genetics Society of America, meeting with the American Institute of Biological Sciences in Stillwater, Okla., Dr. Mundkur reported that although yeast cells have no conventional chromosomes, they do have "chromosomal substance or faintly staining submicroscopic basophile cords."

The cords are dotted with darker-staining particles of DNA protein, a heredity-carrying chemical. Outside the nucleus, in the cytoplasm, there are densely staining particles of RNA protein. DNA is deoxyribonucleic acid and RNA is ribonucleic acid.

To see these structures, Dr. Mundkur had to use ultra-rapid freeze-drying and a staining technique aimed at selective disclosure of DNA protein and RNA protein. Then

he could photograph the heart of the yeast cells with an electron microscope.

In the resting yeast cell, Dr. Mundkur explained, the cords somewhat resembled what would be seen if a fisherman's net were wadded up in a ball and cut through the middle.

In the budding yeast cell, however, the cords in the dividing nucleus straighten out and appear as faint streamers from the mother to the bud cell.

Through a conventional light microscope this organization is not visible—DNA protein in the nucleus appears as a homogeneous mass. But with an electron microscope, the submicroscopic cords could be measured and were found to be about 700 angstroms wide. An angstrom is about four-billionths of an inch.

The DNA protein particles were about 50 to 80 angstroms in diameter, and RNA protein particles in the cytoplasm were about 100 angstroms in diameter.

The particles were identified as RNA protein and DNA protein by putting yeast cells to an enzyme test.

Dr. Mundkur said, "I prefer not to call the submicroscopic cords 'chromosomes' be-

cause they have none of the characteristics of conventional chromosomes."

The nucleus, he said, is "either a degenerative or primitive form." He plans further studies at the University of Connecticut at Storrs to make an evolutionary reconstruction of the different nuclear patterns.

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Chameleon-Like Ditches

► MUDDY ROADSIDE DITCHES may all look alike, but each has an individual character that changes chemically and biologically from hour to hour.

Dip a piece of litmus paper in a water-filled ditch at dawn and the paper turns pink. Try again at three in the afternoon and it may come out gray-green or blue.

The reason for the change was reported by Dr. Stuart S. Bamforth of Tulane University, New Orleans, La., to the American Institute of Biological Sciences meeting in Stillwater, Okla. In the morning, water in a typical ditch, like soda pop in a bottle, contains extra carbon dioxide which makes it acidic and turns the litmus pink, he explained.

This situation exists because nighttime activity of microscopic animals and decaying matter have used up much of the oxygen and released carbon dioxide and phosphate, an essential nutrient for plants, into the water.

As the sun comes up there are many animal forms in the water. Green plants start making food, using up the carbon dioxide and phosphate and releasing oxygen again. The acidity of the water decreases and by three or four in the afternoon, when plant activity is at its peak and animal forms have been reduced, the litmus paper will show a more alkaline reaction.

During a year-long study of daily changes in shallow aquatic habitats—ditches, edges of swamps, streams and ponds no more than two or three feet deep—Dr. Bamforth also found that the rate and extent of chemical changes from hour to hour give some indication as to the balance of plant and animal life in the pool. The more plants in the water, the greater the daily chemical changes. When animals dominate, there is little change.

There are also local differences within a single ditch, Dr. Bamforth pointed out. Changes at one end may proceed rapidly during the day, while the other end, perhaps only 50 feet away, changes quite slowly.

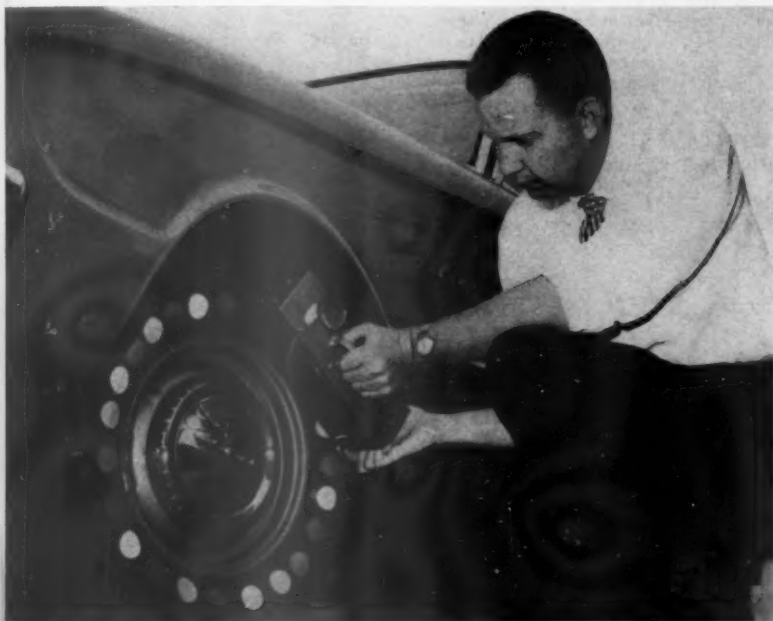
One important conclusion from the study, Dr. Bamforth emphasized, is that comparison of two shallow habitats may have more meaning if daily changes are compared.

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Use Chemical For Smell

► APPLES, BEANS, TOBACCO and avocados may not smell like roses but they do use the same chemical, 1-quinone, that goes into making roses smell good.

Dr. L. H. Weinstein, Dr. C. A. Porter and H. J. Laurencot, all of the Boyce Thompson Institute for Plant Research, Inc.,



TIRE COLOR-WHEEL—Colored sidewall tires may find wide application in the future. Scientists at Esso Research and Engineering Co., Linden, N. J., are developing special butyl synthetic rubber blends for sidewalls, white and multi-colored, that will be resistant to ozone cracking, easy to clean and will retain color. The discs will be exposed to actual road conditions and then checked for durability and ease of cleaning.

in Yonkers, N. Y., reported to the American Institute of Biological Sciences meeting in Stillwater, Okla., that they soaked leaves of these different plants in l-quinic acid tagged with radioactive carbon to see if it was used in producing aromatic substances.

As might be expected of different smelling plants, each type of leaf used the substance a little differently. Beans, they found, absorbed the smallest amount of the tracer substance but converted more than half to

products that are a little closer to the ones responsible for fragrance. Tobacco, on the other hand, soaked up eight times as much of the chemical as beans but converted only about one-fourth of it.

Going a step further, the researchers found that in tobacco, apples and avocados there was twice as much of one aromatic amino acid, phenylalanine, as of another, tyrosine. In beans, the opposite was true.

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BIOLOGY

Wake Early, Bloom Late

► THE MOST EFFECTIVE way to make poinsettias bloom just before Christmas is to shine lights on the plants from midnight to one a.m. each night from Sept. 22 to Oct. 10. Under this treatment the plants are at the peak of blooming on Dec. 20, rather than Dec. 10—the natural peak point.

These conclusions are the result of a two-year study of plant reaction to different periods of light exposure. Drs. Robert C. Miller and C. C. Kiplinger of the Ohio Agricultural Experiment Station, Wooster, reported in an abstract at the American Institute of Biological Sciences meeting in Stillwater, Okla.

Why does giving a plant more light make it bloom later? Dr. Miller explained it this way: Poinsettias start forming flowers when the days get shorter and are called short-day plants. But really they are long-night plants.

Like people, they need their rest. If their night-long "sleep" is interrupted, they do not flower as soon as they would under normal conditions. Under constant light these plants will not bloom at all.

Researchers and greenhouse owners have tried turning on lights at the beginning and end of the daylight hours, thus lengthening the number of hours of exposure to light. Some used four additional hours of light either in two doses or all in one.

However, no method has proved so effective as "waking up" the plant exactly in the middle of the night, Dr. Miller determined. During the daytime, of course, the plant gets normal sunshine.

The middle-of-the-night method works

just as well even if the light is not continuous. A technique known as "flashlighting" is just as effective, not only for poinsettias but for chrysanthemums as well. This consists of dividing each minute of the hour-long period into two seconds of light and 58 seconds of darkness. For poinsettia growers who have large numbers of plants, flashlighting is particularly valuable for cutting down on electricity bills and is one way of staggering loads on power lines.

Either technique works for poinsettias of any age kept at 62 degrees Fahrenheit. The best type of light found so far is regular incandescent light of about 20 foot-candle intensity.

Because the long-red visible radiation is the most effective agent, fluorescent lights—mostly in the blue range—are not suitable, Dr. Miller said. However, a fluorescent lamp concentrated in the red range is being developed and may prove to be better than ordinary electric bulbs.

Just why a plant reacts this way to interrupted nights is not known. The physiology has not been worked out. The factor that controls flowering is believed to be a growth regulator. Root growth inhibits flower budding and vice versa.

It also has been shown that the leaves of the poinsettia produce a flower inhibitor. A branch from a light-treated plant grafted to an untreated host will flower only if the leaves of the host plant are removed. Dr. Miller found that this single graft can also influence the host to flower earlier than usual.

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of Establishing Charges. In general, a uniform system of charging for hospital care will be followed, and this system will relate the charges to the full cost of furnishing that care. The 'full cost' includes the direct cost and a pro rata portion of the overhead cost. We did not set rates."

The other speakers were Samuel J. Tibbetts, administrator of the California Hospital in Los Angeles, and E. Reid Caddy, administrator of the Westmoreland Hospital in Greensburg, Pa.

In California the average daily hospital bill is the highest in the United States, \$41.80, and in Pennsylvania the charge averages \$23.98 per day.

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MEDICINE

Hospital Charges Probed

► HOSPITALS all over the country are raising their charges but for widely different reasons, a hospital administrator reported to the American Hospital Association meeting in San Francisco.

"We found there was no rhyme or reason, or any similarity of method, that we could count on," Benny Carlisle, administrator of the Oklahoma General Hospital in Clinton, said of a survey of hospital charges in Oklahoma.

"We inquired of hospitals, 'What do you base your charges on?' Some said, 'I inherited this rate schedule' . . . others had formulas for mark-up, still others ad-

justed when other hospitals in the area adjusted, but no method that was explainable, or understandable to anyone was used."

Mr. Carlisle was one of three hospital administrators from the East, West and Middle West who spoke on principles of establishing hospital charges.

Mr. Carlisle said that he assisted with the survey of hospital charges in Oklahoma and found the hospitals' prices for pills varied more than 500%. Laboratory charges varied 120% and operating room charges 200%.

"From all this research, we emerged with our Principles of Uniform Methods

PHYSICS

Primary Clue to Matter

Lifetime of the neutral pi meson, the shortest of any nuclear particle, has been measured, Ann Ewing reports from the International Conference on High Energy Physics.

► THE SHORTEST lifetime of an elementary particle—only a quarter of a millionth of a billionth of a second—gives a primary clue to the structure of matter.

This new figure, which links the nuclear mesons directly with the electromagnetic field for the first time, was reported to the tenth annual International Conference on High Energy Physics at the University of Rochester, N. Y., by Dr. A. V. Tollestrup of California Institute of Technology.

The fleeting lifetime was found by Dr. Tollestrup and his co-workers and by Dr. R. G. Glasser and his group at the Naval Research Laboratory in Washington. The scientists examined photographic emulsions to find the tracks necessary to measure the lifetime of the neutral pi-meson. The emulsions were exposed to beams of K-particles in the giant six-billion-electron-volt atom

smasher at the University of California at Berkeley.

Disintegrating atoms leave their tracks in the emulsions, and scientists glean much of their information about nuclear structure by studying these tracks.

The lifetime of nuclear particles is one of their principal properties.

Pi-mesons as a separate class of nuclear particles were first suggested in 1947, and the first examples were spotted experimentally within two weeks. Besides a positive and negative pi-meson, scientists have known for about ten years of the neutral pi-meson and have been trying to pin down its lifetime.

The new measurement gives theoretical physicists a new universal constant and now they must figure out why it exists or relate it to another constant. When the

neutral pi-meson breaks up or decays, two photons of light are produced. These high energy photons, or gamma rays, are purely electromagnetic in character.

Thus the new measurement links mesons and the electromagnetic field for the first time.

The neutral pi-meson is the only one of the 30 particles now known to break up in this fashion. Its lifetime is also shorter by a factor of a million than any of the other known particles.

The possible existence of another new particle called "D" for Dubna where it was first spotted by the Russians was being debated by physicists at the conference. Only four examples have so far been found, so its status as a particle is rather shaky.

In fact some physicists suggest the "D" should stand for "Dubion," to symbolize its dubiousness.

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Super A-Smashers Urged

► ATOM SMASHERS having super high energies can and should be built to probe more deeply into the atomic nucleus, an international group of 30 physicists meeting informally in Rochester, N. Y., agreed.

The five Russian scientists attending the informal meeting reported for the first time that construction has started on a 70 billion electron volt accelerator near Moscow. When completed in a few years, this machine will be the world's most powerful, more than twice as powerful as any now operating.

The atom smashers agreed upon as "feasible and desirable" by the international group are, however, in a much higher energy class, some 300 billion electron volts. This is 100 times more powerful than either the Brookhaven National Laboratory or CERN accelerators.

Estimated cost for the 300 Bev machine and its required equipment is \$300 million. The question of how such a machine should be financed was not considered by the group.

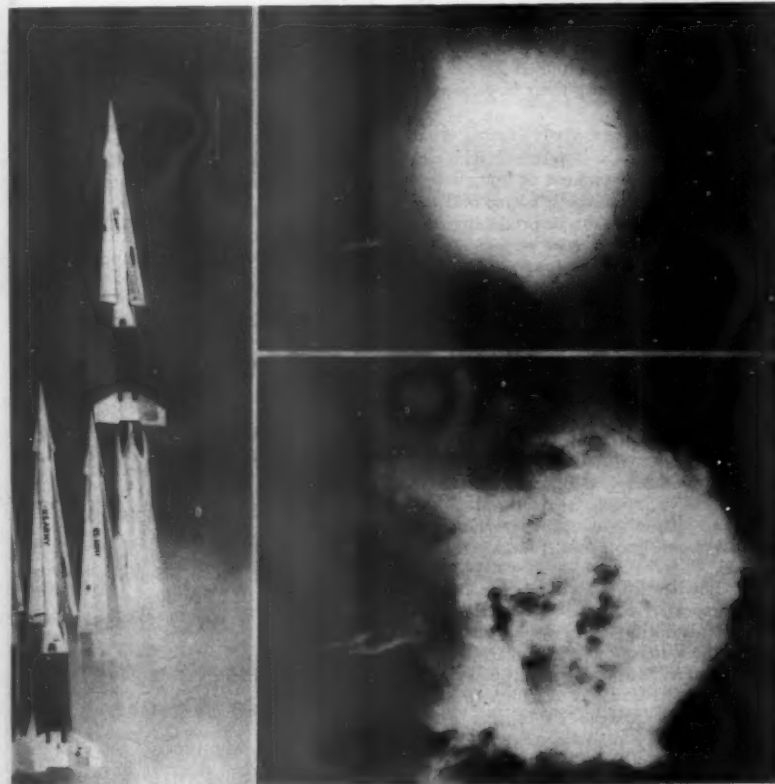
Informally some scientists have suggested that it be built and operated under an international cooperative program. Dr. J. Robert Oppenheimer, director of the Institute for Advanced Study in Princeton, N. J., backs such a plan.

Besides the five Russian scientists and one Polish physicist attending the informal meeting, representatives of the United States, Germany, and United Kingdom, Italy and CERN (an international unit of 13 European nations) attended.

Dr. Robert Wilson of Cornell University, Ithaca, N. Y., who is chairman of the informal group, said the 300 Bev machine could be used as a very high-powered microscope to look deep inside the now-mysterious center of an atomic nucleus.

Dr. Wilson said he personally pictured a nucleus as a fuzzy object surrounded by a diffuse cloud of mesons. As one looks deeper inside the nucleus, the meson population becomes more and more dense. The structure of the deep interior is the current puzzle in nuclear physics.

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MISSILE-KILL—The Nike-Hercules air defense missile takes off (left) and "kills" another Hercules 11 miles above White Sands Missile Range, N. M. The defense missile explodes (upper right) as it intercepts the target missile—small object at left in picture. "Kill" occurs in lower right picture. Tests were conducted by U. S. Army personnel, and Bell Telephone Laboratories and Douglas Aircraft engineers.

PUBLIC HEALTH

Hunger Conquest Sought

► **THE CONQUEST** of hunger by birth control is the only ultimate solution to the problem of adequately feeding the increasing population of underdeveloped countries, M. Wilcox Perrin, chairman of the Wellcome Foundation in London, told the First International Conference on Science in the Advancement of New States meeting at the Weizmann Institute of Science in Rehovoth, Israel.

The British authority advocated world-wide birth control as necessary if world population increases continue at the present rate. But until this solution has world-wide acceptance, he advised new methods and resources for increasing food supplies be exploited to keep up with present growth rates.

Changing dietary habits to provide a better balance between protein and carbohydrates would be one aid. Mr. Perrin said that greater utilization of the oceans as a food source also would vastly increase food supplies. Proper application of veterinary science would increase meat sources by raising the productivity of the animal population.

These are stop-gap measures and no substitute for a universally accepted plan for birth control, Mr. Perrin declared.

"Birth regulation" rather than "birth control" is the answer to the population problem advocated by Dr. M. C. Shelesnyak of the Weizmann Institute who said the population problem "is not limited to the population of man." It includes, he suggested, all animal life, "even microorganisms useful to man as well as to pathogens."

Birth regulation "allows for the concept of increasing where desired, as in the case of

livestock (food source); decreasing, as in the case of pest animals; or maintaining a specific level," the Israeli scientist said.

Effective regulation requires more understanding of the basic physiology of reproduction than is presently available. "Unfortunately, we are still lacking much of the basic information concerning physiological mechanism of conception," Dr. Shelesnyak said. "But since we know the areas requiring research, efforts in that direction, particularly from young scientists in the young states, should yield the necessary knowledge."

Opposed to birth control or "regulation" as the answer to the struggle against hunger, Dr. Josue de Castro of the University of Brazil said the applied knowledge of science and technology can eliminate the need for such control.

"We should not be frightened by the fact that each day in the world there appear 80,000 new mouths to feed, provided that they are matched by 80,000 brains to think and create and 80,000 pairs of hands to work and produce."

Dr. de Castro said science soon may make possible the use of sub-polar and even polar regions as well as the desert area. Food production could be multiplied 500 times by fertilizing and utilizing these large areas of land.

Questions from the newly created Asian-African nations to the lecturers made it clear that for them the conquest of hunger is an immediate and pressing problem; and they want an answer that can be productive now.

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GENERAL SCIENCE

Disease Retards Africa

► **DISEASE** has held back progress in Africa more than any other single factor, Prof. Saul Adler of Hebrew University in Jerusalem, told the delegates from 41 nations attending the International Conference on Science in the Advancement of New States at the Weizmann Institute.

African sleeping sickness (Af. trypanosomiasis) affecting man and domestic animals in the Dark Continent has limited and in some areas completely prevented the use of domestic animals. The African has had to depend on his own muscles.

Prof. Adler said sleeping sickness "is directly and indirectly responsible for a backward agriculture and malnutrition and occasional depopulation."

Advances in applied biology and medicine eventually will overcome "this formidable barrier of disease," the scientist predicted.

Control and eradication of diseases of man and domestic animals must be simultaneously associated with agricultural reform and increased food production if poverty and malnutrition are to be alle-

viated, Prof. Adler cautioned, because of the increase in population that invariably follows medical progress.

Dr. Walter C. Lowdermilk, an agronomist from Berkeley, Calif., also viewed the application of modern agricultural production and conservation as the main hope of developing the underdeveloped new nations.

Dr. Lowdermilk was the prime architect and supporter for the proposed Jordan Valley Authority that would have harnessed the waters of the Jordan so that arid areas in Israel and Jordan might be irrigated and made fertile. Israel accepted the plan, but hostilities between Arabs and Israelis have prevented Jordan's agreement.

He proposed a plan for making the best use of soil and water. Dr. Lowdermilk's program includes training the farmer in new methods adapted to his economic ability to support and carry them through; national resource surveys and research programs for local needs, and agro-industrial, nationally supported pilot projects confined to an area within development capacity

where the inhabitants have a community of interests in the project.

These projects, he said, also would serve as training centers to develop personnel who could then set up similar projects in other localities.

Prof. Lowdermilk said "Israel as a pilot plant for new states is most useful because it was an old and abused land which has been redeemed."

The conference was the project of Abba Eban, president of the Weizmann Institute.

Technical aid agreements between the Republic of Congo and Israel and between the State of Nepal and Israel resulted from the conference.

The Rev. Solomon Caulker, vice president of Fura Bay University in Sierra Leone, a British colony in West Africa, the oldest university south of the Sahara, said, "I would like to see our students coming to the Weizmann Institute."

Of the 122 official representatives, speakers and observers, 22 were leading scientists, educators and economists from the United States. A training program for future physics teachers was made available through the conference to African and Asian states by U.S. scientists.

Representatives from Africa, Asia, Europe, South and North America have endorsed a proposal by the Eastern Nigerian finance minister, Dr. S. E. Imoke, that this conference be an annual event.

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ZOOLOGY

Rare Amazon Longhair Sets Captivity Record

See Front Cover

► **THE RED, LONG-HAIRED** Uakari is a rare monkey from the upper Amazon basin that has set a record of five years in captivity in the National Zoological Park, Washington, D. C. This is longer than any Uakari is known to have lived in captivity.

The senior keeper for small mammals of the Park, Bert Barker, said that this monkey, which normally lives two-thirds of its life in trees, is difficult to keep in captivity. Two years is generally the maximum time the Uakari can be kept alive in captivity.

The keeper said this type monkey is very affectionate and has therefore been given a small companion, a squirrel monkey.

Today, this Uakari monkey, shown on the cover of this week's SCIENCE NEWS LETTER, is strong and healthy.

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AGRICULTURE

Corn Tasseling Time Should Be Watering Time

► **FARMERS** who produce top corn yields apply water when the corn begins to tassel, according to Gordon Hoff, an extension agronomist at the New Mexico State University. He said corn enters a particularly critical period when the tassels begin to show, and dry soil at this time may cause the pollen to fall before the silks appear, resulting in barren or partly-filled ears.

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SOCIOLOGY

Red Chinese Exploit Love

► AN ADMIRER of a Communist Chinese girl told her that he was going to Korea to fight against the Americans. She told him, "Go ahead. It is only after you say you are going to Korea to fight for our country that I feel I love you."

This is how Chinese Communists weave indoctrination into love stories. The example is from Chinese magazine literature and was reported by Dr. Lucy Jen Huang of Boston University to the American Sociological Association in New York.

She cited a similar sentiment, expressed by an admirer who watched the beautiful colors of the sky at sunset with his Chinese girl friend.

He waxed poetic and said he would like to weave her a cloth from the multicolors of the sky. His much more practical girl friend answered that in this time of urgent production and reconstruction he should rather weave blue and gray cloth for the soldiers.

Dr. Huang said that today the editors of Chinese magazines are told by the leaders of the country what stories to publish in order to indoctrinate the people. She told SCIENCE SERVICE that she got the data for her report from the bi-weekly Chinese magazine, *Women of China*.

Dr. Huang reported that the patterns of dating and courtship are changing in Communist China, although some of the old customs still influence the thinking of the people.

She said there is much greater freedom in choosing a mate in China today than there was in earlier times. There are no arranged marriages any more, she said.

There are, however, some semi-arranged marriages, mostly aided by friends of the couple.

The women of Communist China tend to exploit the male more than in former times, and they negotiate more to get what they want in a spouse, Dr. Huang said. There is a great deal of dependency on women in the Communist Chinese society, and men cater more to women than they used to do.

Chinese engagements are short, Dr. Huang said. Just as in older times, young Chinese find it difficult to meet for a long time and get emotionally involved without getting married. Illegitimacy is frowned upon today as it was in earlier times.

The legal age for marriage in Communist China is 18 for women and 20 for men. This is earlier than before. Because of the early marriages, many women have three children by the time they are 25 and lose valuable working hours for the state.

This worries the leaders of the regime, and they therefore try to persuade women to marry at a later age. Today many poems praise the woman who goes to work on her wedding day. Such a woman is called a heroine in Chinese literature, Dr. Huang said.

Today the ideal woman works for five years while she lets her marriage wait until

she has fulfilled this duty to the state. This type woman in Chinese literature even forgets dates with her fiancé as she works eagerly for the state.

There are many reasons for the early marriages in Communist China, Dr. Huang said.

1. Not much money is needed. Communist Chinese do not have elaborate weddings. If they do, people criticize them. Weddings used to be great occasions in China, and Dr. Huang said that older people regret these new modest marriages.

2. When young people get out of school, the state sends them anywhere. Therefore many young people marry someone from the home environment so the two can go away together instead of finding a mate in a strange environment.

3. There are no worries about getting a job. Everyone has to work, regardless.

The Chinese Communists teach through their magazine literature a "socialist morality" in which the state comes first ideally and where love is based on contribution to the party, Dr. Huang said.

She said that Communism is trying to capitalize on old teachings that emphasize that one should think about the family, not about the self. The leaders call the revolution "the large family of revolution," asking for personal sacrifice for the good of the "family."

• Science News Letter, 78:167 September 10, 1960

IQ and Creativity Probed

► TWO GROUPS of young people—both superior in scholastic achievement—have been found to be vastly different in family background and ways of thought.

Drs. Jacob W. Getzels and Philip W. Jackson, both of the University of Chicago, told the American Sociological Association's annual meeting in New York that they had found one group of superior students high in IQ but low in creativity.

A second group of superior students was lower in IQ but high in creativity. Although both groups did well in school, the researchers found teachers preferred the high-IQ students to the creative ones.

The career choices of the two groups, however, were quite different. The high IQ's chose more conventional occupations.

The family life of the two groups was also different. The educational level of both parents tended to be higher for the high IQ's than for the high creatives, and there was a greater age difference between the parents of the high IQ group.

The parents of the high IQ's belonged to more exclusive clubs, participated in more self-educational activities and took more mass media magazines.

The parents of the high IQ's seemed generally to be more watchful about their children's upbringing than the parents of the high creatives.

• Science News Letter, 78:167 September 10, 1960

ASTRONAUTICS

Metal Disc Trains Men To Move on Cushion of Air

► AN AIR-ELEVATED metal disc is being used by the Air Force to train men to function efficiently in a weightless environment.

The disc, which is lifted only a fraction of an inch from the floor by a cushion of air, was designed by Air Force engineers at Wright Air Development Division, Wright-Patterson Air Force Base, Dayton, Ohio.

Men in training for the Air Force's man-in-space program are tested on the air-borne platform wearing full pressure suits.

Each trainee learns to master the principle that every action has an equal and opposite reaction. Then he is able to move the disc with himself on it in the direction he chooses. To do this he must turn his body to the left if he wishes to move the disc to the right.

Unfortunately, this device provides a simulated weightless condition only in one dimension. WADD has plans to construct a sphere-shaped device to which a man can be strapped and rotated in all directions.

This platform, also raised by compressed air, will give a three-dimensional simulation of weightlessness.

It will provide more comprehensive knowledge on some of the effects on man of weightlessness, still one of the unknown hazards of space travel.

• Science News Letter, 78:167 September 10, 1960



SPACE PLATFORM—The air-elevated disc is being used to train men to function in a weightless environment. The trainee is able to move the disc in any direction he chooses. If he wishes to move to the right, he must turn his body to the left and vice versa.

MEDICINE

Reserpine Compounds May Help Treat Tumors

► THE ADDITION of small amounts of reserpine compounds has been found to improve the action of anti-folic compounds now used in the treatment of certain types of tumors and leukemia.

Dr. Eli D. Goldsmith of New York University described successful experiments on the fruit fly at the 11th International Entomological Congress in Vienna. Dr. Goldsmith conducted his experiments at NYU's College of Dentistry where he is professor of histology and coordinator of research.

Previously reported action by reserpine against leukemia and the tumor sarcoma 37 in the rodent led Dr. Goldsmith to test it on the fruit fly *Drosophila melanogaster*, used in studies of heredity.

Using low doses of two reserpine compounds, Singoserp and Serpasil, in combination with anti-folic compound Aminopterin, Dr. Goldsmith lowered the percentage of adult flies that normally emerge from the larvae.

• Science News Letter, 78:168 September 10, 1960

MEDICINE

Epidemics and Deaths Caused by "Cloud Babies"

► NEW RESEARCH ON STAPH, the cause of epidemics and deaths in even spic-and-span hospital nurseries, suggests that some babies live in a cloud of bacteria. The researchers call them "cloud babies" because they contaminate the air and infect others around them.

"Cloud babies" may be sick themselves or merely carriers of disease.

The new concept is an attempt to explain how staph spreads in hospital surroundings.

The researchers say that in an enclosed, unventilated space, a cloud baby may act like a vaporizer and contaminate the air so that a neighboring infant breathes in the infection.

Data were obtained with an apparatus that sampled air to show the spread of *Staphylococcus aureus*. The work was reported in the American Journal of Diseases of Children, 100:161, 1960.

Collaborating on the research were Drs. Heinz F. Eichenwald and Olga Kotsevalov, assisted by Lois A. Fasso, a registered nurse, all of New York.

"Obviously," the investigators say, "both staphylococci and viruses must be acquired by the infants from someone, be it mother, nurse, attendant, physician, or another infant. Once a cloud baby has been produced and the air is contaminated, the personnel too become infected and can then serve to transmit the organisms to other infants or to introduce the infection into clean units. A cloud baby epidemic cannot be terminated by focusing one's attention only on the infected infants or only on the infected staff; both must be screened and any carriers removed from the nursery unit."

The investigators concluded that their evidence clearly indicates that cloud babies

are an important factor in explosive outbreaks of staph infection and disease, both during their stay in the nursery and, after discharge, within the family unit.

An editorial, introducing the cloud babies report, says in part: "Once in a blue moon a journal is privileged to publish an article which introduces an important revolutionary concept. The cloud baby concept of Eichenwald's is in our opinion as revolutionary as the term is clever."

The editorial adds: "What is needed is a carefully designed experimental approach to show how staphylococci can perform the preposterous feat of seemingly 'evaporating' from a moist surface without any hint of a sneeze. When this almost unbelievable phenomenon can be explained, the cloud baby will have a firm foundation."

• Science News Letter, 78:168 September 10, 1960

RADIO

Pinpoint Eight Sources Of Strong Radio Waves

► THE POSITIONS of eight strong sources of radio waves broadcasting in the heavens have been pinpointed by two scientists at the Naval Research Laboratory in Washington, D. C.

Drs. Russell M. Sloanaker and J. H. Nichols made the new, accurate measurements at a wavelength of four inches using the Laboratory's giant 84-foot antenna. The positions they measured are absolute ones, so they can be used for locating other sources of celestial radio waves.

Most determinations of a source's position are found relative to other bright sources. The eight selected sources are scattered over most of the sky visible from Washington, D. C. They include the two strongest sources, Cassiopeia-A and Cygnus-A. The latter is believed to be two vast stellar systems, or galaxies, in collision.

The others are Taurus-A, Virgo-A, the Orion Nebula, the Omega Nebula, Sagittarius-A and Centaurus-A.

• Science News Letter, 78:168 September 10, 1960

GEOPHYSICS

Ionosphere Studied by Scanning Antenna

► AN ANTENNA to provide scientists with a new tool for the study of the earth's reflecting layer of radio waves, the ionosphere, has been developed at the National Bureau of Standards.

Without benefit of electrical or mechanical moving parts, the antenna scans an arc of 42 degrees and can determine immediately the direction of radio signals received from a "forward scatter" transmission.

In this type of very high frequency radio propagation, radio waves are scattered from cloud-like concentrations of electrons in the lower ionosphere and may arrive at the receiver site from many directions.

The new antenna can help pinpoint the direction from which the scattered signal arrives, and could prove of value in tracing the best paths for forward-scan communication.

• Science News Letter, 78:168 September 10, 1960

IN SCIENCE

ROCKETS AND MISSILES

1,000 Satellites Will Need Tracking System

► SO MANY SATELLITES are being planned that a world-wide satellite tracking and cataloging system needs to be built, an American engineer has told the International Astronautical Congress in Stockholm, Sweden.

The engineer, Peter R. Dax of Westinghouse Electric Corporation's electronics division in Baltimore, Md., predicted there will be 1,000 man-made objects in orbit within ten years. He proposed a tracking system of seven powerful radar installations circling the earth.

• Science News Letter, 78:168 September 10, 1960

METEOROLOGY

Weather Records Lost In Antarctic Fire

► THE FIRE at Mirny, the Russian scientific station in the Antarctic, which took the lives of eight scientists and demolished the meteorology building, also destroyed meteorological records vital to the study of weather conditions on the white continent.

Morton Rubin, U.S. Weather Bureau meteorologist who spent 15 months at the Russian station, said all the meteorological records compiled at Mirny since January of this year probably were destroyed. There were probably no duplicates or copies.

"I know that recently, at least, they were not microfilming there," Mr. Rubin said. "Their policy was to keep the records until the end of an expedition and then ship them to the Soviet Union. From there they were released to other countries. It is winter in the Antarctic now and there is no shipping—no way of getting the records out."

The fire started during a storm on Aug. 3, during which wind gusts of 126 miles an hour occurred. Cause of the fire is undetermined, according to cabled reports received by the National Science Foundation from the U.S. Navy station at McMurdo Sound.

A spokesman for NSF said there were about 40 buildings at the Mirny station, and reports indicated that only the meteorology building had been destroyed. Records in small satellite stations, all within about 40 miles of Mirny, are safe.

The scientists who perished include five Russian aerologists, a Russian meteorologist, a Czechoslovakian meteorologist and a German meteorologist.

Mr. Rubin said, "It is a terrible thing. Eight irreplaceable scientists have been lost. I knew some of them personally. It is a great blow to the work we intended to do with their data. But it is heartening to know that the four men who survived will continue."

• Science News Letter, 78:168 September 10, 1960

NE FIELDS

PUBLIC HEALTH

Radiation Use Requires Health, Safety Experts

► A SERIOUS deficit exists in the number of experts being trained to cope with public health and safety problems accompanying the rapidly expanding use of radiation of various kinds in the United States.

Surgeon General Leroy E. Burney of the U.S. Public Health Service warned that by 1970 at least 4,000 additional physicians, engineers and physicists trained in radiological health and protection measures will be needed.

This means that colleges and universities should be admitting at least 600 candidates annually for such training instead of the 200 now being trained each year.

The Surgeon General said that nearly half of the 4,000 additional experts needed would be employed by industry as it expands its use of nuclear power, of X-rays and isotopes.

Others will be needed in health agencies, hospitals, universities and research organizations.

Dr. Burney made his statement in response to a report from the PHS division of radiological health following a three-day symposium at Princeton, N. J., with officials from various universities.

• Science News Letter, 78:169 September 10, 1960

PSYCHIATRY

Mental Patient's Relapse Can Be Predicted

► WHETHER a patient discharged from a mental hospital will need to be readmitted within the next five years can be predicted with the use of a standard psychological questionnaire, David J. Gouws of the Western Psychiatric Institute and Clinic, University of Pittsburgh, told the meeting of the American Psychological Association in Chicago.

In fact, Mr. Gouws found three such questionnaires that could serve as such a psychiatric crystal ball. The first was a selection of 52 questions from the Minnesota Multiphasic Personality Inventory, or MMPI to psychologists.

This 52-question scale, known as the "Ps scale" was originally developed to measure probability of success of shock treatment. The second was a scale developed to measure the adjustment of military personnel. The third was a kind of "yes-man" measure, 24 items also selected from the MMPI to measure "acquiescence."

The three scales, Mr. Gouws found, could be used to predict the probability of relapse regardless of the type of treatment used, whether insulin or electric shock treatment or general hospital supportive care, including individual psychotherapy.

The fact that the three scales predict im-

provement regardless of the type of treatment would seem to indicate that the scales measure is not so much responsiveness to shock treatment as it is of a general characteristic, or group of characteristics, which has been called "propensity to improve."

Another use of a psychiatric interview scale was described to the meeting by Drs. Donald R. Gorham and John E. Overall of the Veterans Administration Central Neuropsychiatric Research Laboratory at Perry Point, Md.

These psychologists developed a short scale that could be used to reveal changes in the symptoms of patients after taking one of the tranquilizers.

Approximately 80 patients were given each of six different kinds of treatment. They were evaluated before and after treatment.

A short scale of only nine questions was found to be reliable for indicating the results of the various treatments on the patients' symptoms and is recommended by the investigators for future research of this kind.

• Science News Letter, 78:169 September 10, 1960

TECHNOLOGY

Tacoma, Wash., Installs Moving Ramps

► HEART-TAXING CLIMBS up four steep blocks in the business district of Tacoma, Wash., will soon be ended by moving sidewalks.

The conveyors will be installed in lighted tunnels through existing buildings and in a covered area-way where existing buildings are being demolished. Installation of the first set of moving ramps should be completed this fall. The total project is expected to be finished by late this year or early in 1961.

• Science News Letter, 78:169 September 10, 1960

ASTRONAUTICS

Heat Resistant Materials A Must for Space Vehicle

► EXTREME temperature-resistant flexible materials to be used in space ship deceleration devices are the goal of \$250,000 worth of contracts recently awarded by the Air Force to two Boston-area companies. The two firms are Arthur D. Little, Inc., Cambridge, and Fabric Research Laboratories, Inc., Dedham.

This or similarly-oriented research must be successfully completed before the Air Force can launch, and recover intact, a technically sophisticated manned space vehicle.

There are several approaches to space vehicle recovery, each with the same goal: the kinetic energy of a moving vehicle must be absorbed by some mechanism during re-entry into the atmosphere in such a way that intense heat will not enter the vehicle itself, perhaps destroying the vehicle and creating unbearable temperatures for any human occupant.

This goal must be attained before a manned space vehicle can be launched.

• Science News Letter, 78:169 September 10, 1960

MEDICINE

Virginia Law Helps Rehabilitate Alcoholics

► GOOD LEGAL AID can make the therapy and rehabilitation of alcoholics successful, Dr. Ebbe C. Hoff, medical director of the division of alcohol studies and rehabilitation of the Medical College of Virginia, told delegates to the 83rd annual meeting of the American Bar Association in Washington, D. C.

In a panel discussion on alcoholism and alcohol-induced offenses, Dr. Hoff said that more than a decade ago Virginia became the first state legally to recognize alcoholism as a disease rather than a crime.

He reported on the success of Virginia's pioneer effort in the rehabilitation of alcoholics under his division, which was established in 1948 by the Virginia Assembly.

The legislation placed the alcoholism rehabilitation program under the state health department and within the setting of a teaching medical center.

Five and a half percent of the patients accepted for care by the division have been referred from the courts. Most of the court referrals are from the judges of the Juvenile and Domestic Relations Court.

Discussions and conferences between the judges and the physicians have proved very beneficial, as demonstrated by the remarkably high rate of clinical success in the rehabilitation of court-referred alcoholics. Care is taken to avoid the implication that referral to the division by the court is a substitute for, or an alternative to sentence.

"The division receives a certain proportion of homeless, chronic court offenders but the plan of long-term rehabilitative care in a clinic setting has not proved a satisfactory method for the 'skid row' personality," Dr. Hoff said.

Therapy begins with a period of hospitalization and a complete medical and psychological examination and diagnosis. A social worker also contributes to the investigation.

In talking to the professional staff, the patient is assured of a confidential relationship. Only with his consent are members of the family, Alcoholics Anonymous and others who may be concerned with his welfare brought into the program plan.

• Science News Letter, 78:169 September 10, 1960

CHEMISTRY

Index Chemicus Lists New Chemicals Promptly

► THE FIRST COPIES of Index Chemicus, a monthly listing of the new chemical compounds reported by scientists all over the world, have been published. More than 60,000 new chemicals are reported each year in scientific literature and few scientists can hope to scan the total coverage of even a limited field. Index Chemicus lists each new compound by name, molecular formula and structural diagram, and gives in addition the original journal reference and author. New chemicals appear in Index Chemicus, published in Philadelphia, Pa., within 30 days after their appearance in the original journal.

• Science News Letter, 78:169 September 10, 1960

PSYCHIATRY

Insane or Faking?

Nearly half of the Federal prisoners sent to a medical center for psychiatric examination have some mental illness. About one-third are returned to court for trial.

By MARJORIE VAN DE WATER

► WHEN YOU READ in the newspaper that a person charged with a Federal offense is sent to a mental hospital for psychiatric examination, how do you picture that person? Do you think he must be a murderer making a desperate attempt to save his own life by feigning insanity?

Dr. Charles E. Smith, assistant medical director of the United States Bureau of Prisons, and Kenneth R. Strawberry, a clinical psychologist associated with him, give us a profile of the typical person coming up for such psychiatric examination. The profile is based on a study of 450 men referred to the Medical Center for Federal Prisoners, Springfield, Mo.

The typical referred prisoner is not a murderer but was involved in some kind of a property crime. Murder is not ordinarily a Federal offense; it is a state crime. The largest group of referred offenders (38%) were those charged with automobile theft. Another 34% were charged with other property offenses and nonviolent crimes such as mail theft, forgery, income tax violation, fraud, draft violation and impersonation.

Bank robbery was a comparatively rare offense among the referred prisoners—only one man out of ten was charged with this offense. An even smaller percentage, less than one percent, of all the men who go to Federal prisons go there for bank robbery.

40.5% Have Psychotic Condition

Are these prisoners really insane or are they shamming? After a three-month examination, the staff of the Medical Center diagnosed nearly half (40.5%) as suffering from some kind of psychotic condition. In addition, nearly one out of ten was mentally defective.

This high rate is a good indication, Dr. Smith and Mr. Strawberry point out in a report to the Public Health Service, that the courts and investigative officers are using a sound basis for picking the prisoners they send for psychiatric examination. The men they send are picked either because they have been treated for mental illness in the past or because of some bizarre conditions involved in their criminal acts.

The typical man coming to the Medical Center for psychiatric examination is about 30 years old. He is single and white. He got as far in school as the seventh or eighth grade at the age of 15 years and left home about a year or two later. He has no dependents and lists his occupation as either semi-skilled, service or laboring.

The longest time he ever held any one job was less than three years. He had

four or more jobs in the ten years before his arrest. During that ten-year period, he moved around some, too, and lived in from one to three different states.

He had been in a mental hospital before and has a record of from one to three prior arrests for felony.

When a man is referred to the Medical Center for psychiatric examination, the staff must make two separate decisions.

1. Is the man competent to stand trial? Under the present law, a person cannot be tried for a Federal offense if he is "unable to understand the proceedings against him or to properly assist in his own defense."

2. Is the man so mentally ill that he cannot be considered responsible for his acts at the time the crime was committed?

In the group studied, a diagnosis of major mental disorder did not necessarily mean that the man was judged to be incompetent to stand trial. A little more

than two-thirds (67%) of the mentally ill prisoners were considered to be incompetent.

Roughly, one-third were returned to the court for trial. Of those who were brought to trial, less than half (49.5%) received prison sentences. Other persons were placed on probation or were released because the charges were dropped.

Nearly 40% of those who were tried were acquitted because they were insane at the time of the offense.

If less than half of those found competent to stand trial went to prison, only 10.9% of those found incompetent were let off "scot free."

A little over one-third of the schizophrenics (the most common mental illness) sent to the Medical Center during 1956 recovered enough to be returned to the court for trial after less than a year of treatment.

Of the 231 persons found to be incompetent to stand trial, one-third were transferred to various mental hospitals in the states in which they had their residence.

But even of those who were released, few stayed long at large. Of the 183 persons, 23% had been re-arrested within one year and another 13% had been re-arrested



MENTAL TEST—The medical officer is finding out how well the young prisoner can "draw a man." This standard mental test reveals certain types of mental abnormalities by distortions in the figure—perhaps a huge head or bands, a very long neck or no neck at all or feet attached directly to the body.

within two to four years of their release. Another 15% were readmitted to a mental hospital within five years.

In nearly every case where the released person was re-arrested, the new offense was similar to the offense for which the man had been previously arrested.

In eight cases, or 12%, the new charges were of offenses involving direct assaults on other persons. Two of the re-arrests were on charges of murder.

Although a relatively high rate of relapsing into earlier criminal habits was found among mentally ill offenders, it appears that the community is being reasonably well safeguarded from further depredations by those mentally ill offenders who are known to be of the most dangerous type.

Relationship to Offense

A definite relationship was found between the type of mental illness diagnosed and the type of offenses charged. Nearly half (45.4%) of the offenses against persons were committed by individuals with some type of paranoid illness. Paranoid persons are extremely suspicious and fearful. Many of their attacks on others are directed against those they imagine to be plotting against them or attempting to do them harm.

Nearly 38% of the men studied at the Medical Center were diagnosed as having significant paranoid illness. It is therefore apparent that paranoid patients—in terms of their numbers, the chronic character of their illness and the seriousness of their offenses—make up a substantial portion of the total problem of the mentally incompetent Federal offenders.

The individual kept at the Medical Center because he is found incompetent to stand trial is given modern psychiatric treatment. This may include the use of tranquilizing drugs, psychotherapy, insulin shock treatment and electric shock treatment—either singly or in combination.

In the days before tranquilizers were available, nearly 30% of the patients received either electric shock treatment or insulin shock treatment. With the introduction of the tranquilizing drugs at the Medical Center in 1954, use of the shock treatments declined. The tranquilizers are now given to about 30% of the patients. Apparently the same types of patients who were once treated with shock treatments are now given tranquilizers.

The rates of recovery and the duration of hospitalization for recovered patients during the period when shock treatment was given do not differ markedly from those during the period when tranquilizing drugs have been used.

• Science News Letter, 78:170 September 10, 1960

TECHNOLOGY

Future Telephone's Pushbuttons Tested

▶ IF AMERICANS One day punch telephone numbers instead of dialing them, they may use a phone with pushbuttons in a square with three numbers on a side and the zero below the middle vertical column. In a Bell Telephone Laboratories test, this arrangement was preferred by users over two vertical rows of buttons, two horizontal rows or a circular arrangement.

• Science News Letter, 78:171 September 10, 1960

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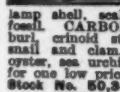


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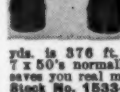
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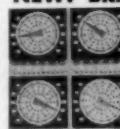
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Books of the Week

For the editorial information of our readers, books received for review are listed. For convenient purchase of any U.S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C.

BIRDS IN COLOUR—Bruce Campbell—Penguin, 103 p., illus. by Karl Aage Tinggaard, \$4.50. Pictorial guide to identify 250 most frequently seen birds of Great Britain.

CIVILIAN POWER REACTOR PROGRAM, Part III: Status Report on Heavy Water Moderated Reactors as of 1959—U.S. Atomic Energy Commission—GPO, 40 p., illus., charts, paper, \$2.25.

HOW ABOUT COLLEGE FINANCING: Counselor's Manual—Carl O. Peets, Ed.—*Am. Personnel & Guidance Assn.*, 43 p., paper, \$1. For high school counselors, supplement to "How About College Financing," 20 p., paper, 30¢, a guide for parents of college-bound students.

CRYOPHYSICS—K. Mendelssohn—*Interscience*, 183 p., illus., \$4.50; paper, \$2.50. Provides short but comprehensive account of low temperature physics, can serve as an introduction to the subject or general survey of the field.

CULTURE AND MENTAL HEALTH: Cross-Cultural Studies—Marvin K. Opler, Ed.—*Macmillan*, 533 p., \$8.75. Compendium of 23 interdisciplinary contributions to social psychiatry, dealing with the variable effect of culture or cultural stress on mental health in various parts of the world.

THE DOUBLEDAY PICTORIAL LIBRARY OF SCIENCE: Chemistry, Physics, Astronomy—J. Bronowski, Sir Gerald Barry, James Fisher and Sir Julian Huxley, Eds.—*Doubleday*, 367 p., illus. by Hans Erni, \$9.95. A readable reference volume, organized as an integrated whole, with index and glossary, for young and old.

DRUMS, RATTLES, AND BELLS: Laffy Kettelkamp—Morrow, 48 p., illus. by author, \$2.75. A child's book about percussion instruments, from ancient to modern times.

ECOLOGY OF THE PEREGRINE AND GYRFALCON POPULATIONS IN ALASKA—Tom J. Cade—*Univ. of Calif. Press*, 270 p., 26 plates, paper, \$2.50. Sets forth an ecological comparison of the two populations of falcons as they now exist in Alaska.

ELECTRONIC BUSINESS MACHINES—J. H. Leveson, Ed.—*Philosophical Lib.*, 272 p., \$15. Based on series of lectures given at Dundee Technical College, Scotland, book discusses

programming and electronic data processing for business purposes.

ELEMENTARY INTRODUCTION TO NUCLEAR REACTOR PHYSICS—S. E. Liverhart—*Wiley*, 447 p., illus., \$9.75. Intended as a textbook for undergraduate course, requiring mathematical skill not beyond calculus and elementary differential equations.

THE FIRMAMENT OF TIME—Loren Eiseley—*Atheneum*, 183 p., \$3.50. Series of lectures exploring the changes in man's vision of nature and himself under the impact of advances in the study of geology, anthropology and biology.

FROZEN FREE RADICALS—G. J. Minkoff, foreword by H. P. Broida—*Interscience*, 148 p., illus., \$5. Monograph presenting the chemical aspects of trapped radicals, also shows the relation of recent studies to their historical antecedents.

GENERAL THEORY OF BANACH ALGEBRAS—Charles E. Rickart—*Van Nostrand*, 394 p., \$10.50. Systematic account of the general theory, with main emphasis on the algebraic aspects of the theory of Banach algebras.

GROUP THEORY IN QUANTUM MECHANICS: An Introduction to its Present Usage—Volker Heine—*Pergamon*, 468 p., \$15. Course for research students in physics and chemistry, assuming a previous course in quantum theory. Matrix algebra required is included as an appendix.

HOW TO VISIT COLLEGES: A Handbook for Students, Parents, Counselors, Principals and Teachers—*Nat. Vocational Guidance Assn.*, rev. ed., 28 p., illus., paper, 30¢ direct to publisher, 1605 New Hampshire Ave., N.W., Washington 9, D.C. Tells about the why, when and how of exploratory college visits.

IMMUNIZATION INFORMATION FOR INTERNATIONAL TRAVEL—U.S. Public Health Service (GPO), rev. ed., 83 p., paper, 25¢. Prepared by the Epidemiology and Domestic Operations Branch, Division of Foreign Quarantine.

INVITATION TO MATHEMATICS—Donovan A. Johnson and William H. Glenn—*Webster Pub. Co.*, 64 p., illus., paper, 85¢. Stimulating booklet, gives young student a bird's-eye view of mathematics and of some of the contributions of great mathematicians.

THE MANAGEMENT OF THE DOCTOR-PATIENT RELATIONSHIP—Richard H. Blum, foreword by Joseph Sadock and Rollan Waterson—*McGraw*, 304 p., \$8.50. To help the doctor understand why patients behave the way they do, and to help him prevent patient dissatisfaction.

MASS COMMUNICATIONS: A Book of Readings—Wilbur Schramm, Ed.—*Univ. of Ill. Press*, 2nd ed., 695 p., \$6.50. Views the various media of mass communication through the writings of outstanding anthropologists, psychologists, sociologists and professional mass communicators.

MEADOWS IN THE SEA—Alida Malkus—*World Pub. Co.*, 71 p., illus. by Margaret Cosgrave, \$2.75. Introduces young readers to the world of plankton, protozoa, crustaceans and mollusks.

NUMBER PATTERNS—William H. Glenn and Donovan A. Johnson—*Webster Pub. Co.*, 47 p., illus., paper, 75¢. Designed to help high school students develop sensitivity to number patterns.

SYMPOSIUM ON NEWER METALS—R. I. Jaffee and others—*Am. Soc. for Testing Materials*, 218 p., illus., \$7.25. Discusses properties of refractory metals, nuclear and light metals, and processing of newer metals.

TOPOLOGY: The Rubber-Sheet Geometry—Donovan A. Johnson and William H. Glenn—*Webster Pub. Co.*, 40 p., illus., paper, 69¢. Invites young students to explore the mathematics of curves, regions, networks and three-dimensional surfaces.

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THE WEB OF NATURE—Ted S. Pettit—*Garden City Bks.*, 56 p., illus. by G. Don Ray, \$2.95. Picture-book about ecology, explains natural plant and wildlife communities and the need for conservation.

WORKING-CLASS SUBURB: A Study of Auto Workers in Suburbia—Bennett M. Berger—*Univ. of Calif. Press*, 143 p., \$3.50. Study based on interviews with 100 families from a suburb in the San Francisco Bay area.

THE WORLD OF MATHEMATICS, Vol. 1-4—Commentaries and notes by James R. Newman—*Simon & Schuster*, 2535 p., illus., paper, boxed set, \$9.95. An anthology of the literature of mathematics, from A'h-mose the Scribe to Albert Einstein, for layman and expert.

WORLD OF THE MAYA—Victor W. Von Hagen—*New Am. Lib.*, 224 p., illus. by Alberto Beltran, paper, 50¢. A concise account of this ancient American civilization.

YOGA: A Scientific Evaluation—Kovoor T. Behanan, foreword by Walter R. Miles—*Dover*, 270 p., paper, \$1.65. A sympathetic presentation and appraisal of Yoga by an Indian scholar, also well-versed in Western philosophy. First published in 1937.

YOUR CHILD'S CARE: 1001 Questions and Answers—Harry R. Litchfield and Leon H. Dembo—*Doubleday*, rev. ed., 257 p., \$3.95. Up-to-date pediatric handbook for mothers.

• Science News Letter, 78:172 September 10, 1960

Do You Know

Fusicoccum canker and Coryneum canker, two diseases recently found on blueberry in eastern Massachusetts, pose a serious threat to the blueberry industry in this area.

There are two principal types of deafness: conductive hearing loss, or middle ear deafness; and perceptive, or nerve deafness.

It is estimated that for every mile walked, 250 tons of stress are put upon the feet.

A study has recently been completed further establishing the existence of a chemical basis for behavior, and showing that the environment can apparently change the brain chemistry.

A noted entomologist says that with the exploding population, mankind has only 50 more years of steaks, and that bees, which are very nutritious, will soon become a staple of diet.

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New Devices Aid Disabled Toward Normal Life

► **NEW DEVICES** that enable disabled persons to work and care for themselves better were reported at the Third International Congress of Physical Medicine in Washington, D. C.

Dr. Leonard F. Bender, associate professor of physical medicine and rehabilitation at the University of Michigan Medical School, told delegates to the congress from 40 countries that a modified shoulder saddle "harness" is gradually replacing the old "figure eight" type among patients at the University's amputee clinic.

This new type of harness makes it easier for persons with amputated arms to do heavy work such as lifting weights. A new cable suspension device on the harness permits much freer motion at the shoulder and eliminates the former difficulty of the harness slipping around the chest because of the lack of free motion between the leather suspension straps and the rings, Dr. Bender said.

Col. H. F. Pierce, an experimental psychologist from Toronto, Canada, demonstrated in an exhibit plastic splints he has invented and patented. These splints, molded to fit about weakened parts of the body, will give the hands of a crippled person support so he can type again.

Dr. Roy H. Nyquist, chief of the physical medicine and rehabilitation section of the Veterans Administration hospital in Long Beach, Calif., described an arm brace, now in use at his hospital, that has special attachments for eating, writing, shaving and brushing teeth. The brace's feeding spoon is fashioned on the principle of a scoop shovel and is fastened to the brace with a swivel joint that allows gravity to keep the spoon level on the way from the plate to the mouth. A stop-bar is arranged so that pressure can be brought against the bar, thus holding the spoon so it is more rigid when food is scooped from the plate.

A sliding bar and pencil holder are also provided on the same brace for writing, and a metal holder is incorporated for an electric razor. The holder can be swiveled to allow for good positioning of the razor.

• Science News Letter, 78:173 September 10, 1960

Paralyzed Given Surgery

► **SURGICAL RECONSTRUCTION** of the arms and hands of persons paralyzed in all four extremities can sometimes provide as much functional activity as mechanical devices, Dr. Earl C. Elkins of the Mayo Clinic told the Third International Congress of Physical Medicine in Washington, D. C.

Dr. Elkins and his associates have a number of patients who have sustained injuries to the spinal cord. He described procedures undertaken in each case to allow for partial function of the arms and hands.

The first essentials in planning such restoration are tests of muscle strength to determine the section of the spinal cord most involved and which muscles may function adequately after full reconditioning.

Simple devices can develop some degree of independence in patients with such

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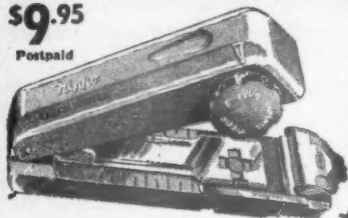
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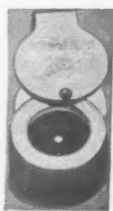
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severe neurologic involvement that surgical reconstruction is impossible.

• Science News Letter, 78:173 September 10, 1960

Baths for Blood Pressure

► PARTIAL BATHING helps patients with high blood pressure, Dr. Takashi Sugiyama, Tohoku University Institute of Balneology, Japan, reported at the Third International Congress of Physical Medicine in Washington, D. C.

Dr. Sugiyama said a simple partial-bathing apparatus he devised had a normalizing action on blood pressure, which continues to fall with its use for two to three weeks.

Water bathing of the whole body or partial bathing of the extremities is a popular form of therapy for high blood pressure in Japan and other oriental countries.

• Science News Letter, 78:174 September 10, 1960

MEDICINE

Three Ounces of Whisky Raises Cholesterol

► THREE OUNCES of whisky will increase the cholesterol in the drinker's blood, four Minnesota researchers have reported.

The finding conflicts with an older theory that heavy drinking protects against hardening of the arteries. Cholesterol is a fatty substance many physicians have linked with artery disease, heart attacks and strokes.

In the tests, 30 volunteers in the Minnesota State Prison were given three ounces of 100-proof whisky a day, while 30 others received only a syrup of the same calorie content as the alcohol.

The alcohol caused a "small but significant" increase in serum cholesterol in the men. Similar tests in dogs showed a much greater rise in cholesterol blood levels.

Earlier studies had indicated chronic alcoholics might have a lower incidence of artery thickening than other persons. But the researchers say the new work made clear that alcohol cannot be considered a cholesterol decreasing agent.

The study is reported in Circulation Research, a journal of the American Heart Association, by Drs. Francisco Grande, Lyle J. Hay, H. William Heupel and Donald S. Amatusio of Mount Sinai Hospital and the University of Minnesota in Minneapolis.

• Science News Letter, 78:174 September 10, 1960

Questions

BIOLOGY—What do the cords in a resting yeast cell resemble? p. 163.

PHYSICS—When were pi-mesons first suggested as a separate class of nuclear particles? p. 165.

SOCIOLOGY—What are the legal ages for marriage in Communist China? p. 167.

Photographs: Cover, Freeman Davis; p. 163, Esso Research and Engineering Company; p. 165, Bell Telephone Laboratories; p. 167, U. S. Air Force p. 170, Bureau of Prisons; p. 176, Tire-Aid Sales.

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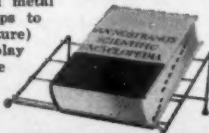
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• Science News Letter, 78:176 September 10, 1960

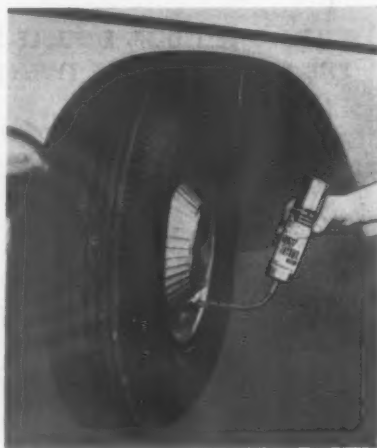
✿ **CLOVER LEAF PIE VENT** keeps juices inside pies. The aluminum pie vent lets off steam that would normally raise the top crust from the bottom crust, and spill the pie juices all over.

• Science News Letter, 78:176 September 10, 1960

✿ **COMBINED SCREWDRIVER-AWL** takes place of two tools. When starting a screw, awl is used to make depression for point, then retracts at touch of a button to reveal screwdriver blade. The handle is of red plastic, and the awl and screwdriver blade are nickel-finished. All internal parts are rust-proofed.

• Science News Letter, 78:176 September 10, 1960

✿ **TIRE INFLATOR-FIRE EXTINGUISHER**, shown in the photograph, inflates tires in seconds and dries wet ignition parts. The tire-aid chemical will extinguish gas, grease and electrical fires. It will not



evaporate and is not affected by high temperatures. It is non-explosive, non-inflammable, odorless and non-toxic.

• Science News Letter, 78:176 September 10, 1960

✿ **INDIAN TEEPEE** is a new creative and educational toy for children up to ten years of age. The tepee, which can be used indoors as well as out, has no pole and is

very durable and self-supporting. The 40-inch-high tent of bleached board is easy to assemble.

• Science News Letter, 78:176 September 10, 1960

✿ **GREASE-GUARD** is a 30-by-48-inch disposable carpet-like mat. It has ten layers of absorbent material laminated on top of a greaseproof backing. Placed over the spot where dripping occurs, it will soak up a lot of oil, grease, acid, brake fluid and anti-freeze.

• Science News Letter, 78:176 September 10, 1960

✿ **SOLAR ENGINE** runs constantly with radiation as the source of power. Needs only light to turn up to 2,000 revolutions per minute. The brighter the light the faster it turns. Known as a radiometer, it even runs under water. The device is made of glass in the shape of a globe and stands six inches high.

• Science News Letter, 78:176 September 10, 1960

✿ **HOME MOVIE EDITOR** enables one to see films as soon as received, cut out the bad shots, rearrange scenes in proper sequence, and splice films together on large reels for continuous shows. The user can inspect 8 mm color or black and white film in motion, and also view single frame stills.

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Nature Ramblings



► **THEY CREEP** and crawl, hop and fly, dig and swim. They are found just about everywhere. We could not live without them. And if we are not careful, we cannot live with them! They outnumber us and surround us. What are they?

This sphinx's riddle is easy enough to answer. Anybody who has ever tried to spend the night in a Florida swamp, who has ever been host to an army of chiggers, or who has ever seen the multitudinous life in a plankton sample from the ocean knows. Just one group of creatures answers to this description: the insects and their allies, known together as the arthropods.

The term arthropod includes all the animals without backbones which have a hard, segmented body covering and jointed appendages. This brings together a numerous and fantastic assemblage of creatures including the insects, spiders, ticks, shrimps, crabs, centipedes, millipedes and a host of other types.

While we humans like to think that we and our backboneed, brainy relatives are far superior to anything else on earth, the

Animal Riddle



arthropods may argue the point.

You see, they have numbers on their side. One estimate asserts that of some 1,115,000 known species of animals on earth, 950,000 of them are arthropods! By way of contrast, there are only about 38,000 species of backboneed animals, including that two-legged one called *Homo sapiens*.

There is an understandable tendency for folks to call any of these 950,000 kinds of creatures by the easy term "bug." But there is pleasure and profit in looking a bit more

closely at them to recognize differences and call them by more precise names. It is easy to place a correct name on them, too. Just stop to take a look at a specimen:

How many pairs of legs does it have? Are there five or more pairs of legs? If there are, is the body worm-like or not? If worm-like, you have two possibilities: your specimen may be a centipede or a millipede. How many pairs of legs are there per segment? The centipedes have only one pair, the millipedes have two pairs on each body segment.

But suppose your "bug" with five or more pairs of legs on its body is not worm-like. Then it can be only one other thing: a crustacean, a group which includes the shrimps, crabs and many other aquatic forms.

If your specimen has fewer than five pairs of legs, there are again two possibilities: If there are four pairs of legs, it is an arachnid, a group which includes the spiders and ticks. If there are only three pairs of legs, then it must be an insect.—Horace Lofin.

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